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MAY, 1902

THE
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JOURNAL



WITH SUPPLEMENT ON
THE BUTTERFLIES OF THE VICINITY OF
NEW YORK CITY

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THE AMERICAN MUSEUM OF NATURAL HISTORY
New York City

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THE AMERICAN MUSEUM OF NATURAL HISTORY was established in 1869 to promote the Natural Sciences and to diffuse a general knowledge of them among the people, and it is in cordial coöperation with all similar institutions throughout the world. Since the Museum authorities are dependent upon private subscriptions and the dues from the members for procuring needed additions to the collections and for carrying on explorations in America and other parts of the world, the attention of persons interested in such matters is called to the brief statement of deeds and needs on the fourth page of the cover of the Supplement.

The American Museum Journal

VOL. II.

MAY, 1902

NO. 5.



OUR "Guide Leaflet" this month pertains to the Local Collection of Butterflies which is on exhibition in the Central hall of the third or gallery floor. It has been prepared by Mr. William Beutenmüller, Curator of Entomology, and is intended to be used for field identification of the species, as well as in the study of the specimens in the cases. All forms of nature-study are of interest and value in the education of children, but entomology seems to present some especially attractive features. The identification and study of the larger forms of the butterflies, moths, beetles, flies and so on is not difficult, and the habits of observation inculcated by the exercise are of lasting value to the pupil.



THE IO MOTH

(*Automeris io*) Hermaphrodite form, natural size.

In the collection of local Lepidoptera formed by the late S. Lowell Elliot, and presented to the Museum by Mrs. M. Schuyler Elliot, there is a very interesting specimen of a hermaphrodite

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form of the Io moth (*Automeris io*). The left side of the specimen shows, in the coloration of the wings, head, thorax and legs, and the structural characters of the antennæ, the features of the normal male, while the corresponding right side shows the features of the normal female, except the hind leg, which is like that of the male. In shape and size, the abdomen is like that of the female, while in color it is like that of the male, except that the under side is dull brown, as in the female.

NEWS NOTES.



DEPARTMENT OF VERTEBRATE PALÆONTOLOGY.—The preparation of the series of skeletons and bones representing the development of the horse, provided for by the liberality of William C. Whitney, Esq., is progressing satisfactorily. The skeleton of the three-toed horse, *Anchitherium*, which was discovered last season, has been mounted and placed on exhibition in the Hall of Fossil Vertebrates. This specimen has been the means of determining positively the occurrence of this marsh-living horse in this country, and has enabled Professor Osborn and his assistants to clear up the doubtful relations of many specimens which were obtained by Professors Leidy and Cope, but which were too fragmentary to be classified satisfactorily. *Anchitherium* was an animal about as large as a small Shetland pony, and differed especially from the Plains horses by having short-crowned teeth and by its broad-spreading three-toed feet which enabled the animal to walk over soft ground without sinking.

The Museum has also secured recently from South Dakota a considerable portion of an excellent specimen of *Mesohippus bairdi*, which, together with material already in the collection, will make possible the mounting of a skeleton showing this stage in the development of the Horse. *Mesohippus* was about the size of a sheep.

In preparing the comparative series of skeletons showing the

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differences produced in the horse by breeding or artificial selection, Professor Osborn has enlisted the aid of Professor J. C. Ewart, who is well known for his experiments at Penicuik, Scotland, in the interbreeding of horses and zebras. From Professor Ewart the Museum has secured a perfect Shetland pony, only $31\frac{1}{2}$ inches high, the smallest on record. The first of the series of horse skulls showing the development of the teeth will soon be placed on exhibition.

Six water-color paintings of horses, asses and zebras have been completed by Mr. Charles R. Knight, and put on view. This series has been made partly as a color-study for use in preparing the restorations of the extinct horses.

The type specimens of the species of horses described by Dr. Joseph Leidy have been loaned to the Museum by the United States National Museum and the Philadelphia Academy of Sciences, for purposes of comparative study.

The exhibit of *Titanotheres* in the northwest corner of the Hall of Fossil Vertebrates has been entirely rearranged to accord with the results of the studies which Professor Osborn has been making during the past winter for the United States Geological Survey. Small models of the heads of the four principal types of *Titanotheres* and of the ancestral form and a model of the running *Brontotherium* have been prepared by Mr. Knight, and are to be placed on exhibition near the fossil bones.



DEPARTMENT OF MAMMALOGY AND ORNITHOLOGY.—Mr. Frank M. Chapman, the Associate Curator of the Department of Mammalogy and Ornithology, is spending his vacation in making a cruise among the Bahama Islands, on a schooner chartered for the purpose, and is making collections of the birds and carrying on special studies of their habits.

THE course of Saturday afternoon talks and laboratory exercises in ornithology, given in the auditorium of the Museum during April and May, has proved to be popular, and is considered very instructive and helpful by the large number of teach-



THE RED-EYED VIREO

From one of two unpublished paintings by J. J. Audubon, obtained by the Museum through the liberality of Percy R. Pyne, Esq.

THE AMERICAN MUSEUM JOURNAL

ers and others who have attended the exercises. The programme of the series was given in the last number of the JOURNAL.

THE head of a large African elephant, mounted in realistic style, has been hung on the wall of the East Corridor hall of the second floor, and an excellent head of the two-horned African rhinoceros has been put in a similar position on the third floor. These specimens have been deposited with the Museum by Mr. William F. Whitehouse, Jr., of Banbury, England, an enthusiastic hunter of large game.

THE head of a large Alaskan moose, presented by Mr. L. S. Thompson, has been mounted and placed in the East Corridor hall, near the entrance to the main mammal hall. The head is remarkable, not only for its size, but also for the unusual development of the antlers, a series of tines having grown out from the middle of the palms on each side.

THE Osprey group, the material for which was collected last year on Gardiner's island by Mr. Frank M. Chapman, has been completed and placed on exhibition in the West Corridor hall of the third floor. It makes a notable addition to the series of groups representing the life history of birds.

THE birds and mammals brought back by Mr. N. G. Buxton as a result of his visit to northeastern Siberia, in connection with the Jesup North Pacific expedition, have been examined by the Department of Mammalogy and Ornithology. The material proves a valuable addition to the collections of the Museum for the purposes of study and exhibition. The value of Mr. Buxton's observations in Siberia is enhanced by the large series of photographs which he brought back with him.



DEPARTMENT OF ANTHROPOLOGY.—The Museum is fortunate in having procured for the Department of Anthropology the Raff collection of wood-carvings from the tribes of western Africa. The objects are mostly of religious or ceremonial character. All are old and in an excellent state of preservation.

THE AMERICAN MUSEUM JOURNAL

THE ethnological material collected by Mr. A. J. Stone on his first expedition to Alaska has been acquired by the Museum. The objects were obtained, for the most part, along the Mackenzie river and the Arctic coast and represent the early culture of tribes which have been greatly affected in late years by French missionaries.

MR. WALDEMAR BOGORAS has returned from his travels in Siberia, in connection with the Jesup North Pacific expedition, notices of which have appeared in the JOURNAL from time to time, and has begun the study of the large amount of material which he has collected and sent to the Museum.

GEORGE FOSTER PEABODY, Esq., has furnished the Museum with funds for the purchase of the Steiner collection of archaeological implements from Georgia, which forms a desirable addition to the Museum series representative of North American archaeology.

B. TALBOTT B. HYDE, Esq., has purchased the Andrew E. Douglass library, which has long been at the Museum with the Douglass collection, and which contains many rare treasures of archaeological literature, and has made it available for use in connection with the Hyde exploring expedition.

MISS M. W. BRUCE has presented the Department of Mineralogy with a large and showy group of calcite crystals from Joplin, Missouri. The chief feature of the group is a large composite scalenohedron, the top of which is capped by a single turban-shaped crystal.

EARLY in April Professor R. P. Whitfield returned from his vacation, which he spent visiting southern California.

MR. GEORGE H. SHERWOOD, the Assistant Curator of the Department of Invertebrate Zoölogy, has gone to Woods Hole to continue the experiments on the artificial propagation of the lobster which have been under way for some years by the United States Fish Commission.

THE AMERICAN MUSEUM JOURNAL

RECENT PUBLICATIONS.

THE following articles of Vol. XVI (1902) of the Museum "Bulletin" have been issued up to April 23:

A New Species of Elk from Arizona. By E. W. Nelson. 12 pages, 7 text illustrations.

Zimmermann's 'Zoologiæ Geographicae' and 'Geographische Geschichte' Considered in their Relation to Mammalian Nomenclature. By J. A. Allen. 10 pages.

The Crania of Trenton, New Jersey, and their Bearing upon the Antiquity of Man in that Region. By Aleš Hrdlička. 40 pages, 4 text figures, 22 plates.

Description of a New Form of Myalina from the Coal Measures of Texas. By R. P. Whitfield. 4 pages, 2 text illustrations.

Observations on and Emended Description of *Heteroceras simplicostatum* Whitfield. By R. P. Whitfield. 6 pages, 5 plates.

Description of a Teredo-like Shell from the Laramie Group. By R. P. Whitfield. 4 pages, 1 text figure, 2 plates.

The Four Phyla of Oligocene Titanotheres. By Henry Fairfield Osborn. 19 pages, 13 text illustrations.

Dolichocephaly and Brachycephaly in the Lower Mammals. By Henry Fairfield Osborn. 13 pages, 5 text illustrations.

The Generic and Specific Names of Some of the Otariidæ. By J. A. Allen. 8 pages.

A New Caribou from the Alaska Peninsula. By J. A. Allen. 9 pages, 6 text illustrations.

A Skull of Dinocyon from the Miocene of Texas. By W. D. Matthew. 8 pages, 4 text illustrations.

On the Skull of *Bunælorus*, a Musteline from the White River Oligocene. By W. D. Matthew. 4 pages, 3 text illustrations.

A New Bear from the Alaska Peninsula. By J. A. Allen. 3 pages, 2 plates.

A New Sheep from the Kenai Peninsula. By J. A. Allen. 4 pages, 2 text figures.

Description of a New Caribou from Northern British Columbia, and Remarks on *Rangifer montanus*. By J. A. Allen. 10 pages, 6 text figures.

THE AMERICAN MUSEUM JOURNAL

ATTENDANCE AT THE MUSEUM DURING 1901.

Department of Public Instruction:	
Lectures to Teachers.....	12,491
Lectures to Members.....	8,998
Holiday Lectures to the Public.....	5,056
Columbia University Course of Lectures.....	2,372
Board of Education, "Free Lectures to the People":	
Tuesday Evening Course.....	41,543
Saturday Evening Course.....	5,551
Meetings of Societies:	
Audubon Society.....	254
Linnæan Society.....	182
Entomological Society.....	100
Anthropological Society.....	43
Mineralogical Club.....	31
Convention of the American Ornithological Union....	275
<hr/>	
Total attendance, lectures, meetings and conventions	76,896
Other visitors to the Museum.....	384,130
<hr/>	
Total attendance for the year.....	461,026

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The American Museum Journal

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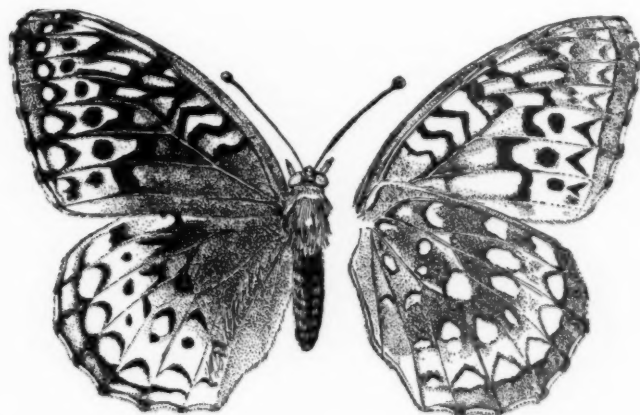
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THE BUTTERFLIES OF THE VICINITY OF NEW YORK CITY. By WILLIAM BEUTENMÜLLER.	Supplement

AMERICAN MUSEUM OF NATURAL HISTORY

The
Butterflies of the Vicinity
OF
New York City



BY

William Beutenmüller

Curator, Department of Entomology

SUPPLEMENT TO AMERICAN MUSEUM JOURNAL

VOL. II, No. 5, MAY, 1902

Guide Leaflet No. 7

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THE BUTTERFLIES OF THE VICINITY OF NEW YORK CITY.

BY WILLIAM BEUTENMÜLLER,

Curator, Department of Entomology.

BUTTERFLIES and moths belong to the order of scaly-winged insects or "Lepidoptera." The two may be distinguished readily by the fact that the butterflies have the tips of the antennæ thickened into knobs, while the antennæ of the moths are thread-, comb-, or feather-like. Butterflies fly in the sunshine, but moths generally are night fliers.

The eggs of butterflies are far more variable in shape than are those of moths and insects of other orders, and their surface often is elaborately ornamented with raised lines and spots. They are laid singly or in masses. The caterpillars are long and cylindrical, and are composed of twelve joints or segments besides the head. Each of the first three segments bears a pair of simple, short, articulated feet. These three segments represent the thorax, and the remaining nine the abdomen, of the perfect insect. The sixth to the ninth and the last joints of the caterpillar as a rule are furnished with a pair each of thick, fleshy limbs, termed "pro-legs." These legs have powerful muscles and are provided at their extremities with a great number of minute recurved hooks which enable the caterpillar to hold to its place of rest. When fully grown, they suspend themselves from some convenient object by means of a silken button, some using a silken thread around the body in addition to the button, and change into chrysalids.

The present Guide Leaflet¹ is a popular account of the butterflies which are to be found within approximately fifty

¹ Those who are interested in pursuing the study of these butterflies further, are referred to the author's "Butterflies Found within Fifty Miles of New York," Bulletin American Museum of Natural History, Vol. V, pp. 241-310, 1893.

BUTTERFLIES OF THE VICINITY OF NEW YORK CITY

miles of New York City and is intended to be used not only in connection with the Local Collection on exhibition in the Museum, but also as a concise handbook for the purpose of identifying the species in the field. The butterflies found in the vicinity of this city are representative of four families, the Papilionidæ, the Nymphalidæ, the Lycænidæ and the Hesperidæ, and will be described in that order. The figures used in illustrating the species are all natural size, and most of them show the under as well as the upper side of the wings. Some of the figures illustrate also the wings of the female. The collection has been installed in the flat cases on the railing of the gallery in the Central hall of the third floor.

Family PAPILIONIDÆ.

The butterflies of this family found in the vicinity of New York are divided into two subfamilies: viz., Papilioninæ and Pierinæ.

Subfamily PAPILIONINÆ.

These are large butterflies, commonly known as Swallowtails, because of the tail-like appendages on the hind wings. In the tropics some species occur without these tails. The antennæ are slender, the knob at the tip either straight or curved. The body is provided with six feet fitted for walking. The caterpillars are usually smooth or are provided with fleshy protuberances, and in the upper part of the first segment is a forked scent-organ which may be thrust out or drawn in at will. This organ gives off a disagreeable odor when extended, which serves as a protection to the caterpillar. The chrysalids are attached by the tail to a button of silk, and the body is suspended obliquely in a loop of silk that passes around it a little in front of the middle. The species of *Papilio* may be separated readily by the following synoptic table:

BUTTERFLIES OF THE VICINITY OF NEW YORK CITY

Synopsis of the Papilioninæ.

With very long tails.

Pale green, with black borders and stripes. *Papilio ajax*.

With short tails.

Ground color black.

With bluish or greenish reflection. *P. philenor*.

With bands composed of yellow spots. *P. asterias*.

With hind wings very thickly clouded with green
scales (male) or blue scales (female). *P. troilus*.

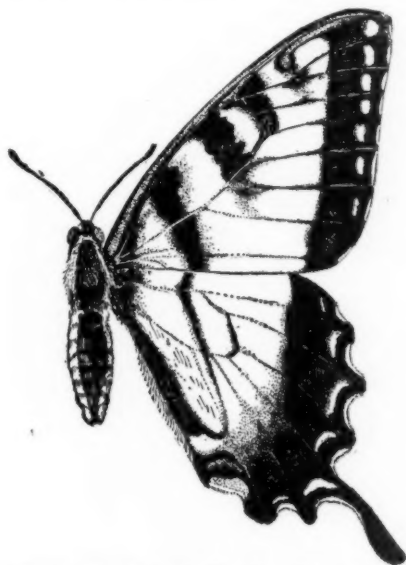
With yellowish spots and broad band at base of
hind wings *P. cresphontes*.

Ground color yellow,

With black bands and stripes. *P. turnus*.

Ground color sooty brown,

With black bands and stripes *P. turnus*, var. *glaucus*.



1. Tiger Swallowtail (*Papilio turnus*).

This butterfly inhabits all sections of the United States and Canada from the Atlantic coast to the Rocky mountains. In the vicinity of New York it is common and double-brooded, the first brood appearing in the latter part of May and June, and the second in July and August. The butterfly is yellow with transverse black bands.

BUTTERFLIES OF THE VICINITY OF NEW YORK CITY

An aberration occurs in the female which is sooty brown, instead of yellow, with the black markings faintly visible (var. *glaucus*). The female lays her eggs singly on the upper surface of a leaf, and the young caterpillar takes up its abode on the same side, reposing on a bed of silk, which it spins for the purpose of retaining its hold on the smooth surface of the leaf. When disposed, it goes to the edge of the leaf to feed. As the caterpillar increases in size, the leaf is somewhat drawn together, making the animal difficult to discover. It is green, and has on each side of the third segment an irregular oval, greenish-yellow patch edged with black and enclosing a purple spot. At the junctions of the fifth and sixth segments is a transverse, narrow, yellow and black band. It feeds on apple, quince, plum, thorn, cherry, birch, basswood, ash, alder, willow, oak, tulip-tree etc.

In the Hall of North American Forestry there is a group showing a branch of the tulip-tree bearing male and female butterflies, the caterpillar and the chrysalid of this species, and illustrating the effect the insect has upon the leaves of the tree.

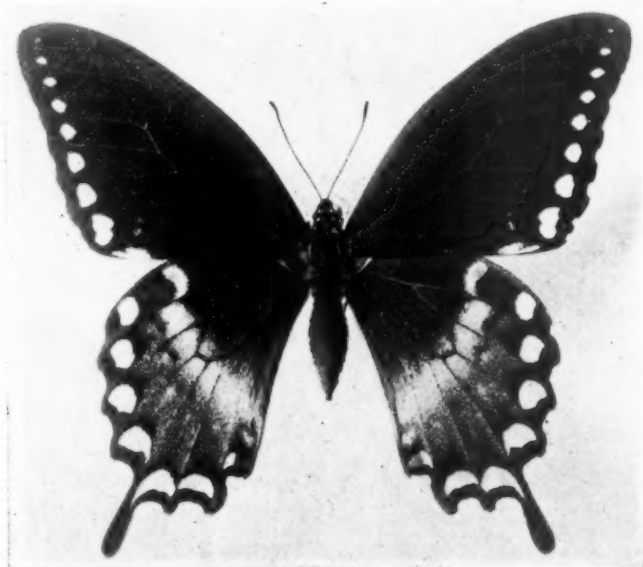


2. Black Swallowtail (*Papilio asterias*).

Very common in open fields, especially where the wild parsnip grows, from May to October, but it is most common in August.

BUTTERFLIES OF THE VICINITY OF NEW YORK CITY

The butterfly is black, with two rows composed of yellow spots on each wing. The hind wings have blue scales or dashes between the two rows of spots. In the female the yellow spots are much smaller, and the blue scales very prominent. The caterpillar is bright pea-green, with a transverse black band on each segment, containing a row of yellow spots. It feeds on parsley, parsnip, celery, carrot and other allied plants. The species is found in Canada and the United States from the Atlantic to the Pacific coasts, in Mexico, Central America and the Antilles.



3. Green Clouded Swallowtail (*Papilio troilus*).

Found in open, sunny spots and along wood paths from the latter part of May until late in June, and again in August. The butterfly is velvety black, with a row of pale yellowish spots near the outer border on the fore wings. The hind wings are densely clouded with green scales in the male, with blue in the female. It is a common species, being distributed over a large area in America north of Mexico. The caterpillar lives on sassafras and spice-bush. It is green, with two very conspicuous eye-like spots on the third segment. It spins a silken web on the leaf on which it abides, drawing the leaf together lengthwise.

BUTTERFLIES OF THE VICINITY OF NEW YORK CITY



4. Giant Swallowtail (*Papilio cresphontes*).

This handsome Swallowtail Butterfly is one of the commonest insects in the South, and is seen everywhere flitting about in the orange groves. When first discovered, it was thought to be restricted to the South, but within the last twenty years the butterfly has extended its range very much, being now found as far north as Canada. In the vicinity of New York it is not common. It is double-brooded; the first brood appearing in June and the second in August. It may be known by its large size and its deep black wings, with a row of large, rounded, yellow spots running obliquely from the apex to near the base. From about the middle of this row begins a row of spots which runs to the hind angle. The hind wings have a rather broad band across the base, and a series of large yellow spots running from the apex to the inner angle. The under side is almost entirely yellow. The caterpillar is dark brown with a white band on each side,

BUTTERFLIES OF THE VICINITY OF NEW YORK CITY

extending from the head to a large whitish patch, mottled with olive and brown. At the end of the body is also a whitish patch. A number of rings are scattered over the body, especially on the anterior parts.

In Florida, the insect is a pest to the orange, and, on account of the large size and voracity of the caterpillar, it is commonly known as the "Orange Dog." It does considerable damage, especially to young trees, which are often completely defoliated. In the North it feeds on the hop-tree (*Ptelea trifoliata*). The female butterfly deposits about five hundred eggs; she scatters them over a wide area, seldom laying more than four or five upon a single plant.

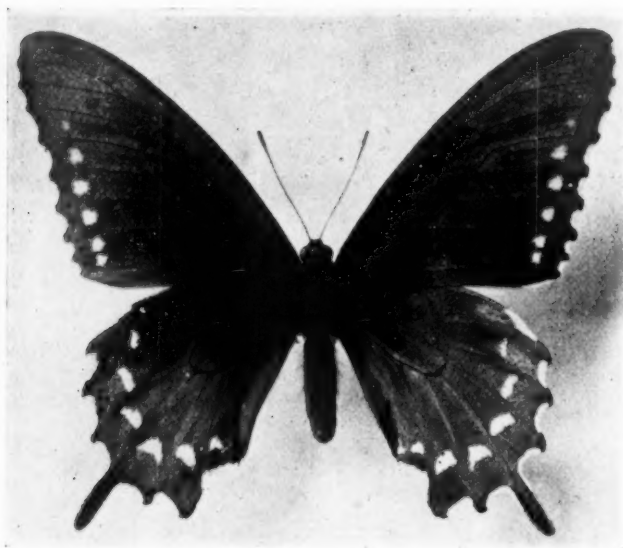
The effect of this insect upon the hop-tree is illustrated by a group in the Hall of North American Forestry consisting of a branch of the tree with male and female butterflies, the caterpillar and the chrysalid.



5. Zebra Swallowtail (*Papilio ajax*).

A pale green species with black borders and transverse stripes; hind wings with a red spot at the anal angle, and with very long tails. Only a few specimens have been seen flying or have been taken in this vicinity. It is common in the Southern and Western States. The caterpillar lives on papaw.

BUTTERFLIES OF THE VICINITY OF NEW YORK CITY



6. Blue Swallowtail (*Papilio philenor*).

Common in this neighborhood, but rather local, owing to the scarcity of the food-plant, snake-root (*Aristolochia serpentaria*). It may be found in May and June, and again in August and September, in open woods, and in gardens, where the caterpillar feeds on the cultivated Dutchman's-pipe (*Aristolochia siphon*). The butterfly may be known easily by the velvety black wings with greenish or bluish metallic reflections, and the row of large orange spots on the hind wings below. The caterpillar is velvety black with long black and orange fleshy tubercles and orange spots. It is found throughout the United States and Canada, and in Mexico.

Subfamily PIERINÆ.

The species belonging to this subfamily are usually of medium size, nearly always white, orange or yellow. They have no tail-like appendages on the hind wings. The inner border of the hind wings is bent downward, forming a channel in which the abdomen rests. They are pretty and graceful, with a tolerably swift, irregular flight. They are known as white, yellow, sulphur or orange butterflies. The caterpillars are

BUTTERFLIES OF THE VICINITY OF NEW YORK CITY

cylindrical, usually with very fine short hairs. They also lack the scent-organ of the Papilios. They live almost exclusively on plants belonging to the pulse family (Leguminosæ) and the mustard family (Cruciferæ). The chrysalids may be distinguished at once by the presence of a single pointed projection in front, and sometimes they are very much enlarged ventrally, so as to be almost triangular in shape. The eggs are much longer than broad, taller than those of any other group of butterflies; they are vertically ribbed, and almost invariably laid singly, though sometimes in open clusters.

Synopsis of the Pierinæ.

Pieris.

White, with black spot on fore wings (two in the female) *P. rapæ*.
 Pure white, without markings *P. oleracea*.
 With veins on under side of hind wings heavily bordered with
 greenish scales *P. protodice*.

Euchloë.

Upper wings falcate, tipped with orange in the male *E. genutia*.

Catopsilia.

Wings bright lemon-yellow *C. eubule*.

Colias.

With silvery spot in middle of hind wings beneath.

Wings sulphur-yellow, with black borders *C. philodice*.

Wings orange, with black borders *C. eurytheme*.

Fore wings with a yellow "dog's-head" patch *C. cæsonia*.

Eurema.

With no silvery spot in middle of hind wings beneath.

Wings bright orange, with black borders *E. nicippi*.

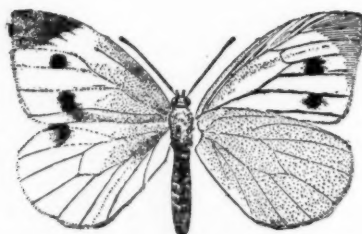
Wings lemon-yellow, borders black, with ferruginous spot
 on apex of hind wing beneath *E. lisa*.

7. White Cabbage Butterfly (*Pieris oleracea*).

This butterfly may be known from its congeners through its having the upper side of the wings entirely white. It is three-brooded, the first brood appearing from the latter part of April until about

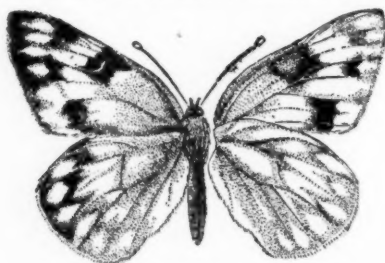
BUTTERFLIES OF THE VICINITY OF NEW YORK CITY

the middle of May, the second late in June until early in July, and the third from late in July until early in September. The spring brood has the under surface of the hind wings and tips of the fore wings heavily washed with yellow, while the summer broods are entirely pure white. The caterpillar is pale green, covered with fine, short, white hairs, and has a dark green line along the back. It feeds on various kinds of cruciferous plants such as cabbage, turnip, radish, mustard and horseradish.



8. Imported Cabbage Butterfly (*Pieris rapae*).

This species is an importation from Europe, and is exceedingly common from May until November. It may be seen everywhere, in gardens, pastures and other places, but especially in cabbage fields. It was first noticed on this continent in Quebec, Canada, about 1860, whence it gradually extended its range. In 1868 it was independently introduced at New York. Since then the butterflies have spread from Canada to Florida and westward to the Pacific coast. The caterpillar lives on all kinds of cruciferous plants, such as cabbage, to which it is particularly injurious, cauliflower, turnip and radish.

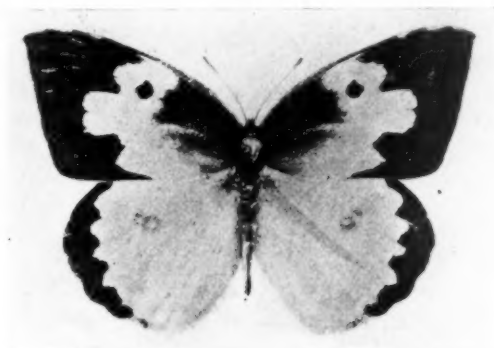


9. Southern Cabbage Butterfly (*Pieris protodice*).

This butterfly is white with black dashes and spots. There are two broods each year, the first coming out in May and June and the second from about July to October. The caterpillar lives on

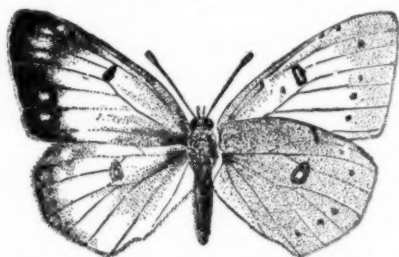
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cabbage and allied plants. The species is found in the United States from ocean to ocean, and also in Mexico. It was common about New York in former years, but since the introduction of the Imported Cabbage Butterfly it has disappeared almost entirely, though it is sometimes common for only a season or two in certain localities.



10. Dog's-Head Butterfly (*Colias cæsonia*).

This southern species is occasionally taken in this vicinity. In the South it is common. It may be known readily by the yellow dog's-head patch on the fore wings, and broad black borders.



11. Clouded Sulphur Butterfly (*Colias philodice*).

Very common everywhere in this neighborhood, along roadsides, in open fields and in gardens. It is especially common when the red clover is in blossom. Sometimes hundreds of these yellow butterflies may be seen in dense masses upon wet spots in the road, swarming when disturbed and settling again when the interruption ceases. It is apparently triple-brooded, and may be found on the wing from the latter part of April until about the middle of October. The

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butterfly is readily known by its sulphur-yellow wings with black borders. A pale form of the female occurs in which the wings are whitish or yellowish-white; sometimes a male form occurs which is thickly covered with black scales, so as to obscure the yellow ground color. The caterpillar lives on clover and allied plants.

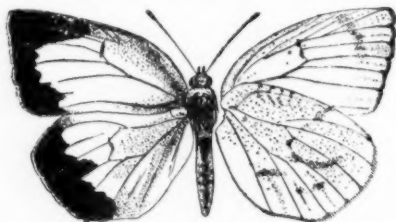
12. Orange Sulphur Butterfly (*Colias eurytheme*).

Very rare in this vicinity, but common in the Southern and Western States. It differs from *Colias philodice* in having the wings orange instead of yellow. The caterpillar lives on clover.



13. Orange-Tip (*Euchloë genutia*).

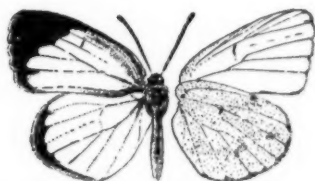
This pretty species is local, and appears to be restricted to certain localities. It is on the wing early in May, and flies until about the middle of that month. The butterfly is white with the tips of the fore wings orange in the male; the under side of the hind wings is marbled with green. The caterpillar is dark yellowish-green, glossy, with a yellow stripe along the back and a broader white one on each side. It feeds on rock cress (*Arabis*).



14. Orange Butterfly (*Eurema nicippi*)

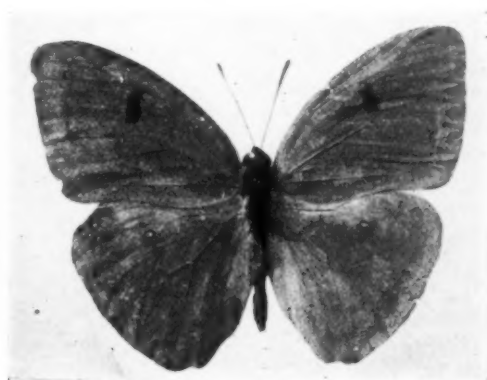
About 1880 this beautiful species appeared in considerable numbers in Central Park, New York City, and other places around New York, but since then only a few specimens have been taken. The butterfly is found from the Atlantic to the Pacific, and in most of the States south of Lat. 40° in Mexico and in Central America. In the South it is very abundant. The caterpillar lives on senna (*Cassia*).

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15. Little Sulphur Butterfly (*Eurema lisa*).

A small yellow species with black borders. Rather common in sandy places in June and again in the latter part of August and early in September. The caterpillar is grass-green, with minute hairs and white elevation; feeds on clover and senna (*Cassia*).



16. Cloudless Sulphur Butterfly (*Catopsilia eubule*).

This species may be recognized by its large size and sulphur-yellow wings. The caterpillar feeds on different species of senna (*Cassia*). It is a common species in the South, but is rarely met with in the vicinity of New York, a few specimens having been taken in recent years in September and October. In 1870 it was found in abundance on Fire Island, L. I., and numbers were also seen at Long Branch some years ago. It has also been taken in different places on Long Island, Staten Island, Manhattan Island, Westchester County and New Jersey. It is found from New England and Wisconsin to Patagonia, S. A.

Family NYMPHALIDÆ.

The members of the family found in this vicinity are divided

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into the following subfamilies: Euploëinæ, Nymphalinæ, Satyrinæ and Libythenæ.

Subfamily EUPLOËINÆ.

This subfamily is almost entirely confined to the equatorial regions of America and Asia. The butterflies average far above medium size, and have rounded, somewhat elongate wings. Their flight is powerful and sustained, although usually slow. They often sail high in the air on expanded wings. The eggs are slender obconic, vertically ribbed and transversely striate, and are laid singly on the food-plant. The caterpillars have two or more segments each with a pair of long, slender, flexible filaments above. The chrysalids are always suspended from a silken button at the hinder part. Only a single species of this family is found in this vicinity—the Milkweed Butterfly.



17. Milkweed or Monarch Butterfly (*Anosia plexippus*).

Very common in this vicinity, appearing in May and June, but becoming more numerous in August and September. In years when conditions have been favorable to the insects' increase, immense swarms of the butterfly may often be seen in autumn migrating southward. It inhabits North America, South America, West Indies, Sandwich Islands, Australia, New Zealand and the Malay Archipelago. The caterpillar lives on milkweed, and the chrysalid is pale green with golden markings.

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Subfamily NYMPHALINÆ.

This is the most extensive subfamily of butterflies and embraces an almost infinite variety of forms in every stage of its existence. The flight of the butterflies is usually strong. They generally pass the winter as a butterfly or a caterpillar, and in no instance does the egg hibernate.

Our species may be separated by the following table:

Synopsis of the Nymphalinæ.

Argynnis.

Orange-brown with black markings; hind wings with silver spots beneath.

Large species.

Upper side of hind wings black, with a bluish reflection and two rows of spots. *A. idalia.*

Under side of hind wings with a broad yellowish band. *A. cybele.*

Under side of hind wings with a narrow yellowish band. *A. aphrodite.*

Small species.

With silver spots on under side of hind wings. . . . *A. myrina.*

Rusty brown on under side of hind wings and without silver spots. *A. bellona.*

Euptoieta.

Upper side fulvous, with black markings; under side of hind wings with brown and ashen-gray shades. *E. claudia.*

Melitæa.

Black, with rows of pale yellow spots, and a row of brick-red spots along the outer borders. *M. phaëton*

Brown and black, similar to *P. nycteis*.

Under side of hind wings checkered. *M. harrisii.*

Phyciodes.

Upper surface fulvous, with black markings.

Under side of hind wings with silvery white bands. . . . *P. nycteis.*

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Under side of hind wings with grayish, brown and ochraceous blotches (form *marcia*), or entirely ochraceous with a brown outer patch (form *morpheus*), and with transverse brown lines. *P. tharos*.

Polygonia.

Wings falcate ; brown with black markings.

Under side of hind wings with a broken C *P. interrogationis*.

Under side of hind wings with C not broken. *P. comma*.

Under side streaked with black lines. *P. progne*.

Under side marked with olive-green on the outer parts. . *P. faunus*.

Hind wings above with a large white spot on the costa. . *P. j-album*.

Vanessa.

Wings velvety brown, with yellow borders. *V. antiopa*.

Smaller in size, with a broad fulvous transverse band on each wing. *V. milberti*.

Pyrameis.

Wings velvety brown, with an oblique red band. *P. atalanta*.

Wings fulvous with black markings.

With two large eye-like spots on under side of hind wings. *P. huntera*.

With five small eye-like spots on under side of hind wings. *P. cardui*.

Junonia.

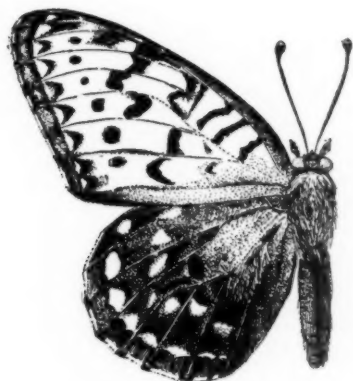
Wings sepia-brown, with large eye-like spots above. *J. cænia*.

Limenitis.

Reddish brown with black borders and veins, and a transverse band across the middle of the hind wings. . *L. disippus*.

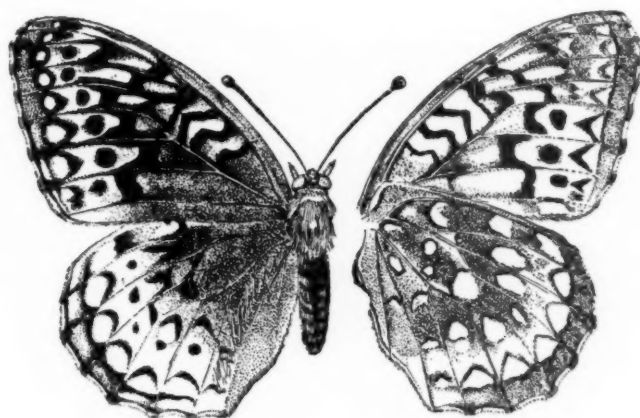
Velvety black, with metallic blue shades and spots. . . . *L. astyanax*.

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18. Regal Fritillary (*Argynnis idalia*).

Found during July and August in swampy meadows or adjacent fields, and it is sometimes common locally. When feeding, the butterfly nervously flutters its wings and darts off at the least disturbance. It is single-brooded, and hibernates as a caterpillar. The caterpillar feeds on violets.



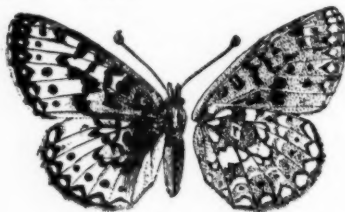
19. Great Spangled Fritillary (*Argynnis cybele*).

Rather common in swampy places. Makes its appearance in the latter part of June, and is found throughout July and the early part of August. The caterpillar lives on violets and hibernates.

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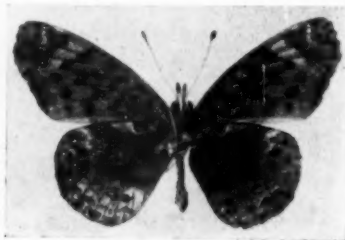
20. Silver-Spotted Fritillary (*Argynnis aphrodite*).

Orange-brown with black spots. Closely allied to *A. cybele*, but may be separated from that species by its smaller size and the absence of the dark basal area on the fore wings above in the male, and also by the narrower yellow field between the outer margin and the brown basal color on the under side of the hind wings. It is found in wet meadows and overgrown fields in June and July. The caterpillar hibernates. It feeds on violets.



21. Silver-Bordered Fritillary (*Argynnis myrina*).

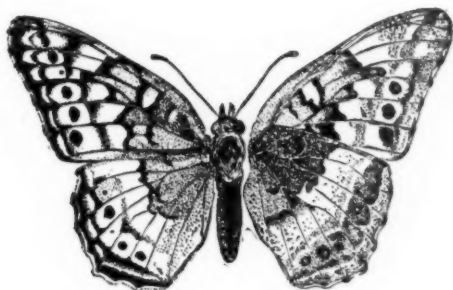
A small orange-brown butterfly, with black markings and silver spots on the hind wings beneath. It is common in swampy places and damp meadows. It is on the wing from the latter part of May until early in September, and it is triple-brooded. It flies rather slowly amongst tall grass, when not feeding. When alarmed, it flies only a short distance, and then settles again in the grass. The caterpillar feeds on the violet. Those of the last brood hibernate.



22. Meadow Fritillary (*Argynnis bellona*).

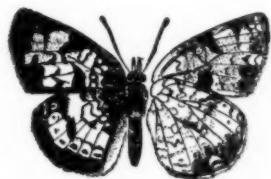
Common in this neighborhood and found together with *Argynnis myrina*, but it is not as abundant as the latter. In general appearance it very much resembles *A. myrina*, from which it differs in the absence of the silver spots on the hind wings beneath. The caterpillar feeds on the violet. The last brood of caterpillars hibernates.

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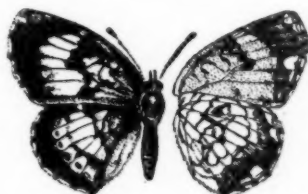
23. Variegated Fritillary (*Euptoieta claudia*).

Not common in the vicinity of New York. It is found usually in damp, open places where the species of *Argynnis* occur. There are probably two broods here, one in June and July and the other in August and September. The caterpillar feeds on violet, mandrake, passion-flower etc.



24. Pearl Crescent (*Phyciodes tharos*).

Very common from May to the latter part of September or early October. The form which appears in May and June is called *marcia*; it produces the summer form, *morpheus*. It is found in open meadows and fields, and is probably three-brooded in this vicinity. The caterpillar hibernates. It feeds on various kinds of asters.

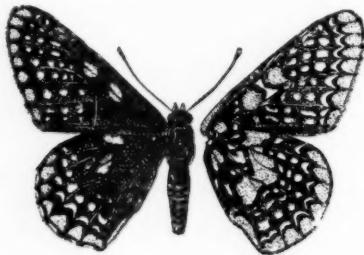


25. Silver Crescent (*Phyciodes nylcteis*).

In general appearance this butterfly resembles *Phyciodes tharos*,

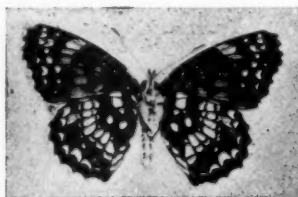
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especially in color and markings on the upper side; but the under side of the hind wings is very different, being provided with silvery white bands and crescent-shaped spots, which are absent in *P. tharos*. It is also larger than that species. It is somewhat rare in this vicinity. It is on the wing in June and July. The caterpillar lives on different kinds of asters and sunflowers.



26. Black Checker Butterfly (*Melitæa phæton*).

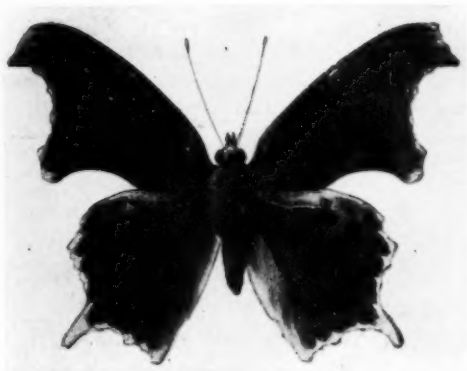
This pretty black species, with yellow and brick-red spots, is single-brooded, and is not rare in this vicinity, but is local in swampy places. It is found on the wing about the middle of June. In flight the butterfly is slow and sluggish. It alights on leaves, shrubs and grasses and on the ground. The eggs are laid in masses. The young caterpillars spin a web, in which they live until the following spring; after the caterpillars become older they leave the web and live singly on the leaves. Their food is turtle head (*Chelone glabra*), woodbine (*Lonicera*), *Gerardia* etc.



27. Harris's Butterfly (*Melitæa harrisii*).

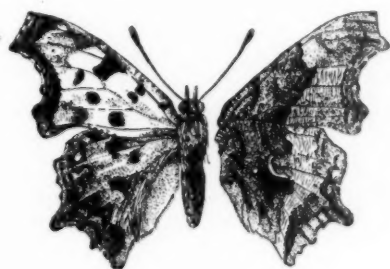
Very rare in this neighborhood. On the upper surface it looks very much like *Phyciodes nycteis*, but the under surface is quite different. It is on the wing from about the middle of June until August. The caterpillar feeds on the aster.

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28. Violet-Tip (*Polygonia interrogationis*).

Found in glades, gardens and roadsides in the vicinity of woods. It is very fond of sucking the sap which flows from wounded trees, especially maples and oaks, and is attracted by juices of decaying fruits. When at rest on the trunk of a tree, it is very difficult to detect, owing to the brown color of the under side of the wings, which closely resembles that of the bark of the tree or of a withered leaf. It is rather common during warm weather, but difficult to capture. In this vicinity there are three broods, the last one hibernating in the butterfly state. This butterfly has two forms; the hibernating one being known as form *fabricii* and the other as *umbrosa*. *Fabricii* has the upper sides of all the wings orange-brown, with pale and black spots. The form *umbrosa* has the hind wings very dark brown with the markings obliterated. The caterpillar lives on elm, hackberry (*Celtis*), hop and nettle.



29. Hop Merchant or Comma Butterfly (*Polygonia comma*).

A very wary insect with a quick, nervous flight, yet at the same

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time audacious and pugnacious. It darts recklessly at and about objects in the air, vainly pursuing even a passing bird or dragonfly. They tussle with one another too to such an extent that their wings are almost invariably rubbed and broken after their wrangle. When disturbed, the butterfly takes a zigzag trip over a tree, house-top or fence, often without alighting anywhere, and returns to within a few inches of the old spot. The butterfly usually takes his pastime toward sunset, when only now and then a patch of sunlight remains among the shadows of the trees. The caterpillar is sometimes very destructive to hop vines, and in some localities it is known to growers as the "Hop Merchant," and according as the metallic color on the chrysalis is gold or silver, the price of hops will be high or low. This insect is quite common in the vicinity of New York. The hibernating form of this butterfly is called *harrisii* and the summer form *dryas*. The former differ from the latter in having the hind wings above considerably paler. It feeds on the elm and false-nettle (*Bæhmeria*), as well as on the hop-vine. The butterfly has a silver comma on the under side of the hind wing, hence the name "Comma Butterfly."



30. Marbled Comma Butterfly (*Polygonia faunus*).

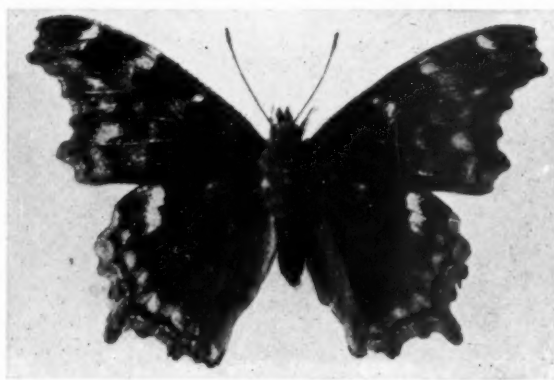
Very rare in this vicinity. It is a northern insect, and is common in mountainous districts. It may be recognized easily by the deeply incised and notched outer margins of the wings; and by the under side of the wings, which is beautifully marbled with various shades of brown, from light to dark, and mottled with gray-white. In the light shade there is a row of olive-green spots, followed by a band of the same color within the outer border. The caterpillar lives on birch (*Betula lenta*), willow and wild and cultivated gooseberry.

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31. Gray Comma Butterfly (*Polygonia progne*).

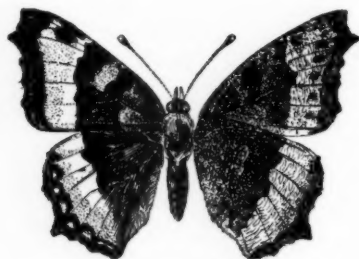
The upper side of the wings is similar to that of *P. comma*, but the under side is very different; these are gray-brown, closely streaked with fine, short lines. It is less common than *P. comma*, but its habits are much the same. It is double-brooded, the first brood appearing in early summer and the second in August and September. The second brood hibernates. The caterpillar feeds on wild and cultivated currant and gooseberry. The figure shows the under side.



32. White J Butterfly (*Polygonia j-album*).

This species is somewhat rare in the vicinity of New York. In the Northern States the butterfly is abundant. It is yellowish, washed with rusty brown; basal half ferruginous, beyond which are large black spots on the fore wings and a white spot near the tip of each wing.

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33. American Tortoise-Shell Butterfly (*Vanessa milberti*).

Somewhat rare in this vicinity, but common throughout the Northern States and Canada, and westward to the Pacific. The eggs are laid in masses, usually on the under side of the leaves of the nettle, and the caterpillars live in swarms.



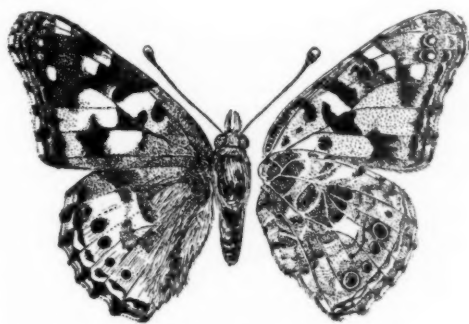
34. Mourning-Cloak Butterfly (*Vanessa antiopa*).

This species hibernates in the butterfly state in sheltered places. It may be found under stones, stumps of trees, sticking to the rafters of barns or in the crevices of walls, sometimes huddled together in numbers, with the wings doubled together above the back, and apparently lifeless. During the first warm days of April and May the insects crawl forth from their winter quarters and hover about the sappy stumps of recently felled trees. About the middle of July the

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butterfly becomes scarce, and remains so until the advent of the second brood, in August. The female deposits her eggs in a cluster around a twig near the petiole of a leaf. The caterpillars are gregarious in habits, living together in companies. The first brood of caterpillars appears in June and the second in August. The butterfly is velvety brown with pale yellow border. It is distributed over the entire breadth of the northern hemisphere below the Arctic circle, as far as the thirteenth parallel of latitude. The caterpillar lives on elm, willow, poplar and hackberry (*Celtis*).

A group of this species is on exhibition in the Hall of North American Forestry.



35. Thistle Butterfly (*Pyrameis cardui*).

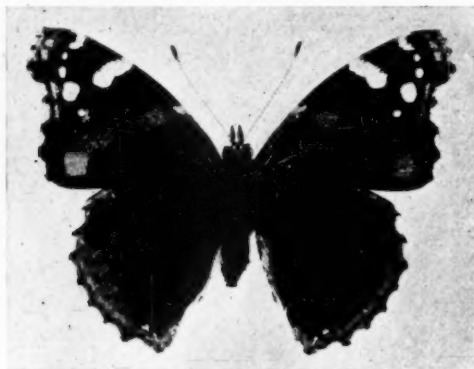
A cosmopolitan species, very common everywhere. In this vicinity it is doubled-brooded, and the caterpillar lives snugly within a few leaves spun together with silken threads. It lives on the thistle, burdock, sunflower and hollyhock.



36. Painted Beauty or Hunter's Butterfly (*Pyrameis huntera*).

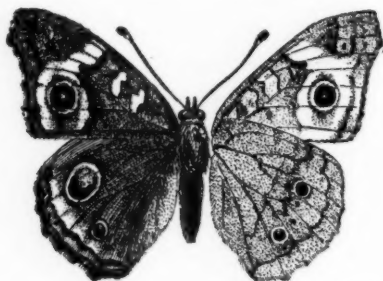
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This butterfly may be recognized at once by the white net-like marking and large eye-like spots on the under surface of the hind wings. Common in open fields and along roadsides. It is double-brooded and flies from May to October. The caterpillar feeds on cudweed (*Gnaphalium*) and on wormwood (*Artemisia*); it draws the leaves or flowers together and forms a rude case, within which it lives. The species is found throughout the United States and Canada.



37. Red Admiral (*Pyrameis atalanta*).

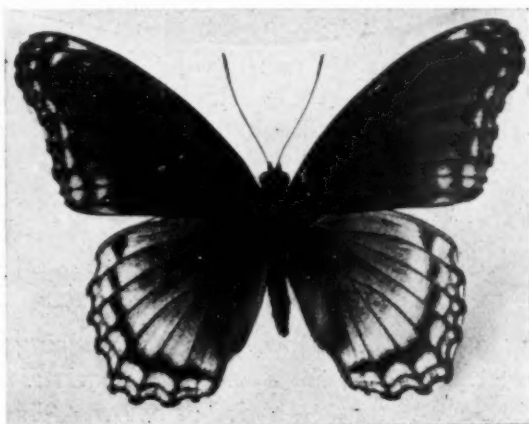
Occurs over all North America and in Europe. In this vicinity it is sometimes very common, from the latter part of May until November, and it is double-brooded. The butterfly is brown with a broad red band across each wing. It is found usually along wood paths or in open woods and fields. The caterpillar draws together the edges of a leaf and forms a commodious cavity which shelters it. It feeds on nettle, hop and false nettle (*Bahmeria*).



38. Buckeye Butterfly (*Junonia cænia*).

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Sometimes rather common in this neighborhood. The species may be recognized easily by the four eye-like spots on the upper side of the wings. The caterpillar feeds on *Gerardia*, plantain and snap-dragon. It is double-brooded. Found throughout the United States and southward.



39. Blue Viceroy (*Limenitis astyanax*).

This butterfly frequents orchards and feeds on fallen fruit. It is black with a bluish lustre, and the hind wings are clouded with bluish shades. It is double-brooded, the first brood appearing in May and June and the second in July and August. The caterpillar feeds on apple, thorn, gooseberry, cherry, plum, huckleberry etc.



40. Brown Viceroy (*Limenitis disippus*).

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In general appearance this butterfly resembles *Anosia plexippus*, but may be distinguished therefrom at once by its smaller size, scalloped outer borders and the black band across the middle of the hind wings. It is common in this vicinity, where it is found usually along the borders of damp places and in waste fields. It is double-brooded, the first brood appearing in June and the second in July and August. The young caterpillar of the last brood rolls the tip of a leaf around itself, remains thus enclosed all winter and completes its transformation the following spring. It feeds on poplar, willow, apple, plum and oak.

Subfamily SATYRINÆ.

The species of this subfamily are chiefly found in woods, glades and lanes, not often being seen in clearings or open fields. The flight of the butterflies is low, feeble and dancing in style, and is not long sustained. In color they are nearly always brown, with or without eye-like spots, above or below. The caterpillars are furnished with a fork-like process at the end of the body. Their food is different kinds of grasses. The species may be distinguished by the use of the following table:

Synopsis of the Satyrinæ.

Neonympha.

Outer borders rounded.

- Wood-brown, with two eye-like spots in yellow rings
on each wing.....*N. eurytus*.
With a row of black spots in a light shade on each wing, *N. canthus*.

Debis.

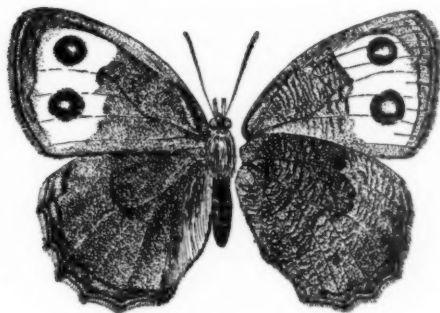
Outer borders scalloped.

- With a row of black spots in a light shade on each
wing.....*D. portlandia*.

Satyrus.

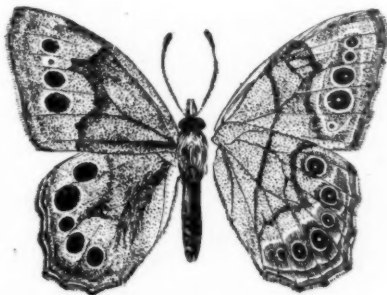
- Wood-brown, with yellow figure-8-like patch on the fore
wings.....*S. alope*.
With yellow patch reduced and darker.....form *maritima*.
With yellow patch absent.....form *nephele*.

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41. Blue-Eyed Grayling (*Satyrus alope*).

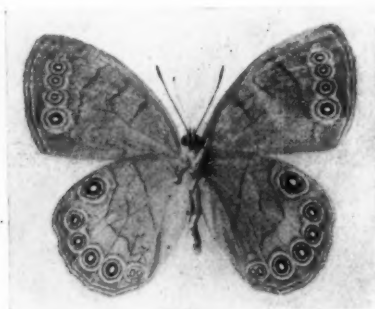
Found plentifully throughout July and August in grassy fields and open woods, especially along the borders of woods where the large trees have been felled and a young growth is appearing. It flies low, and for but a short distance, and rests upon the leaves of bushes or trunks and twigs of dead trees. In the North a form occurs which lacks the yellow marks on the fore wings (var. *nephele*). The caterpillar feeds on grasses.



42. Pearly-Eyed Grayling (*Debis portlandia*).

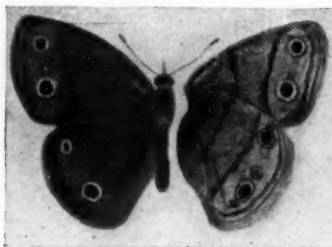
Generally distributed in this vicinity, but it is local. The flight is somewhat like that of *Neonympha canthus*. It often rests on the trunks of trees, sallies forth at any passing butterfly and retires again to its chosen post of observation. It also flies near the ground, along the edges of woods or in the forests among bushes and trees. Found from the latter part of June to about the first of August, and it is single-brooded. The caterpillar feeds on grasses.

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43. Eyed Grayling (*Neonympha canthus*).

Found in the latter part of June and through July and August, flying in swampy places. Its flight is low, with a slow, jerky motion. It settles here and there among the tall grasses. By beating the grass one may often start the butterflies in numbers. The caterpillar hibernates. It feeds on grasses.



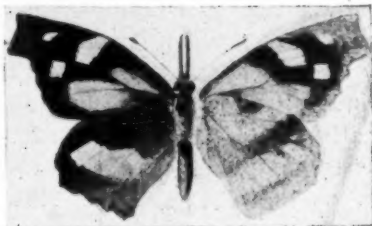
44. Little Wood-Satyr (*Neonympha eurytus*).

Common from the latter part of May until August, in woods and near-by fields, especially fields more or less overgrown with shrubs. It is single-brooded. The caterpillar feeds on grasses.

Subfamily LIBYTHEINÆ.

The species belonging to the subfamily *Libytheinæ* are characterized by their long, beak-like, palpi (mouth parts), and by the males having four feet adapted for walking, while the females have six. They are commonly known as Snout-Butterflies. Only a single species is found in the vicinity of New York.

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45. Snout Butterfly (*Libythea bachmani*).

This species may be recognized easily by its long beak-like palpi, hence the name Snout Butterfly. It is somewhat rare here, though it sometimes appears in numbers. It flies during May, July, August and early September, and is two- or three-brooded. The caterpillar feeds on hackberry (*Celtis*).

Family LYCÆNIDÆ.

These are small butterflies, with or without fine, short, hair-like tails on the hind wings. They have six legs adapted for walking. They are commonly called Blues and Hair-Streaks. The caterpillars usually live in flower-heads of various kinds of plants, feeding on the tender parts of the leaves only when compelled to do so. They are more or less oblong oval or oval, with the head retractile into the first segment, and have a ridge along the back. The chrysalids are short, fastened at the anal extremity, and have a loop of silk around the body, much as do the *Papilionidæ*. They may be separated as follows:

Synopsis of the Lycæninae.

Thecla.

Hind wings with tails.

- Slate-gray, with an orange spot at the anal angle of hind wing.....*T. melinus*.
- Sepia-brown, with a double, broken, white transverse band on both wings beneath.....*T. calanus*.
- Sepia-brown, with four irregular, wavy white lines across the upper wing beneath.....*T. strigosa*.

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- Thickly scaled with green on the under side, with wavy
white and brown transverse bands.....*T. damon*.
Hind wings strongly toothed or notched.
Outer half of hind wings heavily overlaid with whitish
scales beneath.....*T. irus*.
Hind wings ferruginous with zig-zag transverse lines
beneath.....*T. niphon*.
Hind wings not toothed or notched.
Under side of hind wings with outer half ferruginous. . *T. augustus*.
Hind wings with outline evenly rounded (female); hind angle
produced (male).
Under side of hind wing with an outer row of large
orange spots.....*T. titus*.

Feniseca.

- Wings ochraceous, with black border.
Under side of hind wings with many whitish rings. . *F. tarquinius*.

Chrysophanus.

- Small size, glossy orange-red.
Hind wing brownish-gray with black spots beneath. *C. hypophlæas*.
Large size, copper-brown with black spots.
Under side of wings whitish, with black spots.....*C. thoë*.

Lycæna.

- Hind wings with a thread-like tail. Color, blue.
Under side of hind wings with two orange spots. . . . *L. comyntas*.
Hind wings without thread-like tail. Color, blue.
With terminal row of orange spots on under side of hind
wings.....*L. scudderii*.
Without orange spots on hind wings beneath. . . . *L. pseudargiolus*.
Smaller than *pseudargiolus*.....form *neglecta*.
Spots on under side running together.....form *lucia*.
Spots on basal area of hind wings not running together,
form *marginata*.
Terminal rows and basal spots on hind wing promi-
nent, not running together.....form *violacea*.

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46. Gray Hair-Streak (*Thecla melinus*).

A small slate-colored species, with an orange patch, enclosing a black spot, near the anal angle of the hind wings. It is double-brooded, and flies in open woods and gardens during May, June, July and August. The caterpillar lives on the heads of the common hop-vine, and also on the bean.



47. Banded Hair-Streak (*Thecla calanus*).

Not common in the vicinity during June, July and August, in woods and about shrubbery. The butterfly is sepia-brown above, and on the under surface, with two double white stripes on each of the fore and hind wings. It is single-brooded. The caterpillar feeds on oak, chestnut, hickory and walnut.



48. Striped Hair-Streak (*Thecla strigosa*).

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Very rare in this vicinity. It is closely allied to *T. calanus*, but differs in the position and number of white lines on the under side. The butterfly appears to be local, and is rarely found away from thickets. It flies early in July, and is rarely found on the wing after the first of August. The eggs are laid in July and remain unhatched until spring. The caterpillar feeds on oak, holly, thorn, plum and apple.



49. Hoary Hair-Streak (*Thecla irus*).

Rather common locally in this neighborhood, especially in pine woods and open places near where huckleberries grow. The caterpillar is said to feed on these plants. It lives on the wild plum also. The butterfly appears during the latter part of April, and is on the wing until about June.



50. Coral Hair-Streak (*Thecla titus*).

The butterfly frequents flowers in open sunny places near thickets and woods. It is found in July and early in August, and is single-brooded. In this vicinity it is considered rare, but occasionally it has been found in considerable numbers. Its color is sepia-brown, with a row of coral-red spots along the outer border on the under sides of the hind wings. The caterpillar lives on plum and wild cherry.

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51. Green Hair-Streak (*Thecla damon*).

Found on the wing in May and June, and again in July and August. It occurs only in localities where cedar trees grow, this tree furnishing the food of the caterpillar. The butterfly when disturbed flies for a short distance and suddenly drops to the ground, folding its wings. Owing to the green color on the under side of the wings, it is quite difficult to detect the insect in the grass.



52. Brown Elfin (*Thecla augustus*).

In color on the upper surface this insect is like that of *T. irus*, but it differs greatly from that species as to the under side of the hind wings, which have the basal half deep brown and the outer half rusty brown, with a row of minute dark spots. It is found in pine woods in April and May.



53. Pine Hair-Streak (*Thecla niphon*).

Rare in this vicinity. Found in pine woods, in April and early in May. It is single-brooded. The caterpillar feeds on pine.

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54. Tailed Blue Butterfly (*Lycæna comyntas*).

A small blue butterfly common everywhere, in meadows, clover fields and roadsides from May to September. It is three-brooded, and the caterpillar feeds on the flower-heads and tender leaves of clover, bush-clover (*Lespedeza*) and tick-trefoil (*Desmodium*).



55. Scudder's Blue Butterfly (*Lycæna scudderii*).

Very rare in this neighborhood. Only a few specimens have been taken. It is double-brooded, the first brood appearing in May and June, and the second in July and August. The caterpillar feeds on lupines.



56. Spring Azure Butterfly (*Lycæna pseudargiolus*).

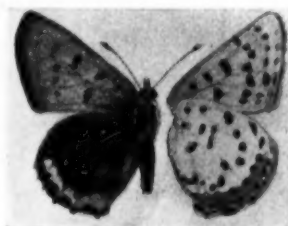
A very common species found in open sunny places, especially in woods. There are five forms of this butterfly in this vicinity. The forms *lucia*, *marginata* and *violacea* are found in April and early in May. The forms *neglecta* and *pseudargiolus* are found in the summer until September. The caterpillar lives in the flower-heads and tender leaves of various kinds of plants.

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57. American Copper Butterfly (*Chrysophanus hypophlæas*).

Very common in open, sunny fields and meadows, from May to October. Three-brooded in this vicinity. The caterpillar lives on sorrel (*Rumex*).



58. Bronze Copper Butterfly (*Chrysophanus thoë*).

This butterfly is double-brooded, and is not common in this vicinity. It is found in swampy places. The first brood appears in June or early in July, and the second from the middle of August to the middle of September. The caterpillar feeds on smart-weed (*Polygonum*) and sorrel (*Rumex*).



59. The Wanderer (*Feniseca tarquinius*).

Somewhat rare and local in this neighborhood. It is usually found where alders grow. The caterpillar feeds on plant-lice, which live in masses and are covered with thick white waxy excretions. The caterpillar particularly affects the species (*Schizoneura tessellata*)

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which occurs on the alder. It is three-brooded, the first brood appearing from the latter part of May to the middle of June; the second early in July, continuing to fly until the early part of August; the third brood appears from the middle of August to the end of September.

Family HESPERIDÆ.

The members of this family are known as Hesperids or Skippers, the latter name having been applied on account of the peculiar flight of the species. The flight is very rapid, varied and interrupted, terminating suddenly after a short career and suddenly resumed. It is hurried and intermittent, never steady or sailing like that of the other groups. The butterflies almost invariably delight in the hottest sunshine, and generally frequent open meadows. They may be known readily by their antennæ, which are abruptly hooked at the tip. The caterpillars have between the head and first segment a distinct neck which gives them a very characteristic appearance.

Synopsis of the Hesperidæ.

Ancyloxypha.

Fore wings blackish, washed with orange, ochraceous.

Under side of hind wings clear orange, ochraceous... *A. numitor*.

Pamphila.¹

With a short black bar on fore wings at end of cell.

Under side of hind wings with a large yellow patch in the middle.....*P. hobomok*.

Under side of hind wings almost entirely yellow, brown at base.....*P. zabulon*.

¹ It is very difficult to give a satisfactory synopsis of the genus *Pamphila*, as the sexes of each species differ in markings on the upper side, especially on the fore wings. The males of some species are provided with a stigma, which is more or less distinct or wanting entirely; while in the females it is always absent. The markings and coloration of the under side of the hind wings, however, are constant in both sexes, and by means of this they may be readily united, or the species separated. The stigma is a velvety mark on the fore wings.

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- Under side of hind wings clear yellow.....*P. logan*.
 With an oblique velvety black stigma on fore wings (male).
 Under side of hind wings yellowish with an indistinct
 spot-like band in the middle.....*P. sassacus*.
 Under side of hind wings rusty brown with a conspicu-
 ous row of white or pale yellow spots.....*P. leonardus*.
 Under side of hind wings yellowish, with black spots..*P. phylæus*.
 Under side of hind wings with a distinct, yellow, large
 spot-like band across the middle connected with a
 patch at the base.....*P. peckius*.
 Under side of hind wings with a more or less distinct,
 yellow, spot-like band in middle, not connected
 with the patch near base.....*P. mystic*.
 Under side of hind wings thickly scaled with olivaceous..*P. cernes*.
 With stigma on fore wings indistinct.
 Under side of hind wings vinous, with a few very indis-
 tinct, paler spots in the middle.....*P. verna*.
 Under side of hind wings lighter brown than upper..*P. metacomet*.
 Under side of hind wings rusty brown, with violet patches, *P. accius*.
 With stigma on the fore wings curved.
 Under side of hind wings dirty yellowish, with a lighter shade
 in the middle.....*P. huron*.
 Stigma on fore wings pinched in the middle.
 Under side of hind wings orange-brown, with a few yel-
 low spots in the middle.....*P. pontiac*.
 With stigma connected with an indistinct, narrow basal streak.
 Under side of hind wings ochraceous, with a row of lighter
 spots in the middle.....*P. manataaquæ*.
 Stigma broken in the middle.
 Under side of hind wings rusty brown, with a row of lighter
 spots in the middle, or olive-brown.....*P. otho* var. *egeremet*.
 Stigma absent.
 Under side of hind wings with a large, bright yellow
 patch in the middle.....*P. massasoit*.
 Both sexes similar; under side of hind wings dirty
 yellowish-brown, with a lighter patch in the
 middle.....*P. viator*.
 Stigma minute, almost invisible.
 Under side of hind wings washed with gray.....*P. hianna*.

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- Fore wings dark brown, with bronzy lustre and two semi-transparent spots in the middle.
 Under side of hind wings paler than the upper, with a lighter reflection.....*P. ocola*.
 Fore wings brown without spots.
 Hind wings with white fringes.....*P. fusca*.

Pyrgus.

- Black, with transverse rows of white spots on the fore wings,
P. tessellatus.
 Black, with one row of transverse, white spots.....*P. centaureæ*.

Pholisora.

- Sooty black, with an irregular curved row of small white dots.....*P. catullus*.

Nisoniades.

- Deep brown, fore wings thickly scaled with gray between the outer bands.....*N. brizo*.
 Smaller, with the scales more regularly distributed over the fore wings.....*N. icelus*.
 Small, with white spots on the outer band.....*N. lucilius*.
 Larger, marked like *lucilius* but less distinctly.....*N. persius*.
 With bands on fore wings heavy and very conspicuous, white spots very indistinct.....*N. martialis*.
 Large species, allied to *martialis*, but with heavy white spots.....*N. juvenalis*.

Eudamus.

- Chocolate-brown, with an amber-yellow patch on fore wing.
 Under side of hind wings with a large silvery-white spot in the middle.....*E. tityrus*.
 Under side of hind wings broadly smeared with white along the outer border.....*E. lycidas*.
 Under side of hind wings with two transverse bands.
 Fore wings with small white spots.....*E. pylades*.
 Fore wings with large white spots.....*E. bathyllus*.
 Fore wings with a broad, oblique, amber-yellow band.
 Outer border of hind wings scaled with gray.....*E. cellus*.
 Hind wings with long, tail-like appendages.
 Wings and body above with long green hairs.....*E. proteus*.

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60. Small Skipper (*Ancyloxypha numitor*).

A small orange-brown species with black borders. Common in marshy grassy places in June, July, August and September, and is three-brooded. The caterpillar feeds on grasses.



61. Massasoit Skipper (*Pamphila massasoit*).

Flies in swampy places in June and July, and is sometimes common locally. The caterpillar feeds on grasses.



62. Logan Skipper (*Pamphila logan*).

Rare in this vicinity, but common in the Southern States. Found from June until September. The caterpillar feeds on grasses.

63. Zabulon Skipper (*Pamphila zabulon*).

Differs from *P. hobomok* by having the under side of the hind wings almost entirely bright lemon-yellow with the base brown. The female is always brown and resembles var. *pocahontas*.

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64. Hobomok Skipper (*Pamphila hobomok*).

Rather common along the edges of woods and sunny wood paths, during the latter part of May and throughout June, disappearing early in July. It is single-brooded. It flies close to the ground, and settles on leaves of plants when at rest. In the female a form occurs (var. *pocahontas*) which is brown instead of yellow. The caterpillar feeds on grasses.



65. Leonard's Skipper (*Pamphila leonardus*).

Rather scarce in this neighborhood. Single-brooded. It is on the wing during the latter part of August until early in September. The caterpillar feeds on grasses.



66. Huron Skipper (*Pamphila huron*).

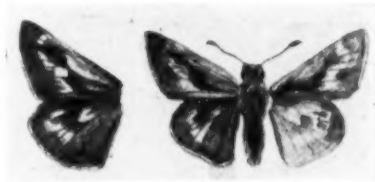
Somewhat rare, but common farther south. It is single-brooded. The caterpillar feeds on grasses.

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67. Sassacus Skipper (*Pamphila sassacus*).

Not common in this vicinity in May and June. It occurs along roadsides and borders of woods. The caterpillar feeds on grasses.



68. Mystic Skipper (*Pamphila mystic*).

Rather common locally. Found in open grassy meadows late in May and throughout June, and again in August and early September. The caterpillar feeds on grasses.



69. Common Skipper (*Pamphila cernes*).

Very common everywhere from May to September in grassy meadows. It flies usually in company with *P. peckius*. Double-brooded. The caterpillar feeds on grasses.

70. Brown Skipper (*Pamphila fusca*).

A small, uniformly brown species with the fringes on the hind wings whitish. It is rare in this vicinity, and is found in sandy places. In the Southern States it is quite abundant.

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71. Egeremet Skipper (*Pamphila otho*, var. *egeremet*).

Sometimes rather abundant locally in June and July. The form *otho* is common in the Southern States and does not occur in this vicinity. The caterpillar feeds on grasses.



72. Metacomet Skipper (*Pamphila metacomet*).

Not common. Found in June and July. It frequents flowers in fields and open ground. Single-brooded. The caterpillar feeds on grasses.



73. Hianna Skipper (*Pamphila hianna*).

Appears during the latter part of May, and is on the wing until about the middle of June. A brown butterfly with a few white dots on the fore wings, and heavily shaded with gray on the under sides of the wings. Very rare in this vicinity.

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74. Peck's Skipper (*Pamphila peckius*).

Found everywhere in meadows, and is one of the most common species of Hesperids in this vicinity. It is double-brooded, the first brood appearing from the latter part of May to the middle of July, and the second brood in August and September. The caterpillar feeds on grasses.



75. Pontiac Skipper (*Pamphila pontiac*).

Not common. Found in June and July. It is single-brooded. The caterpillar feeds on grasses.



76. Ocola Skipper (*Pamphila ocola*).

A dark brown species, with slight bronzy lustre. There is a semi-transparent spot on the fore wings at the end of the cell, and a small dot a little beyond. Sometimes traces of a third spot are found beneath the large one. Very rare in this vicinity, but common southward.

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77. Spotted Skipper (*Pamphila phylæus*).

Rare in this vicinity, but it is a common insect in the Southern States. The caterpillar feeds on grasses.



78. Clouded Skipper (*Pamphila accius*).

Very rare in this vicinity, but a common insect in the Southern States. It is deep brown, with violet shades on the under surface of the hind wings. Found in June and July.



79. Glass-Spotted Skipper (*Pamphila verna*).

Common, but not abundant, in June and July. Flies in grassy meadows. It is single-brooded. The caterpillar feeds on grasses.



80. Manataaqua Skipper (*Pamphila manataaqua*).

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Found in June, July and August. It is single-brooded. The butterfly in general appearance looks very much like *P. cernes*, but it is considerably larger, and on the under side of the hind wings there is a row of pale spots. The caterpillar feeds on grasses.



81. Broad-Winged Skipper (*Pamphila viator*).

Scarce in this neighborhood. It is single-brooded, and is on the wing in June.



82. Checkered Hesperid (*Pyrgus tessellatus*).

Not common in this vicinity. Appears to be triple-brooded, being found from the latter part of April until October. The caterpillar feeds on mallow, *Sida*, Indian mallow (*Abutilon*) and marsh-mallow (*Althæa*).



83. Grizzled Hesperid (*Pyrgus centaureæ*).

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Common locally, and is on the wing during the latter part of April and until about the middle of August. The butterfly has a remarkable distribution. It is found in Lapland, Scandinavia, Labrador, and from the Canadian hills and Vermont to North Carolina. The early stages are unknown.



84. Sooty Skipper (*Pholisora catullus*).

Very common everywhere in open fields, gardens, roadsides and meadows. It is double-brooded, and flies from May until September. The caterpillar feeds on goosefoot (*Chenopodium*); it draws the leaves together with silken threads, making a case within which it lives.



85. *Nisoniades brizo*.¹

Found in May and June in moist, shady woods and along wood paths. The butterfly flies swiftly and near the ground. It is single-brooded. The caterpillar feeds on oak.

86. *Nisoniades lucilius*.

Rather common locally in open woods and roadsides, in May and June. Single-brooded. The caterpillar feeds on wild columbine (*Aquilegia*).

¹ The butterflies belonging to the genus *Nisoniades* are known commonly as "Dusky-wings."

BUTTERFLIES OF THE VICINITY OF NEW YORK CITY



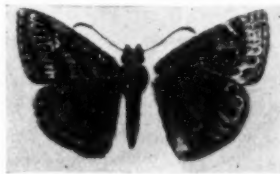
87. *Nisoniades icelus*.

Not rare in open woods, and especially along wood paths. It flies during May and June. It is single-brooded. The caterpillar feeds on aspen, willow and witch-hazel.



88. *Nisoniades persius*.

Allied to *N. lucilius*, but is larger, with the markings less distinct. It is quite common locally, in woods and along shady roadsides. It is single-brooded and flies during May and June. The caterpillar feeds on willow and poplar.



89. *Nisoniades martialis*.

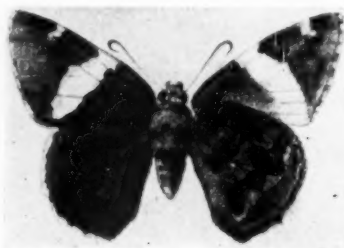
Quite scarce in this vicinity, and found in localities similar to those in which are found other species of *Nisoniades*, in May and June, and again in July and August. The food-plant is said to be wild indigo (*Indigofera carolina*).

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90. *Nisoniades juvenalis*.

A common species found from May until the end of August, especially in oak woods or roads near by. It is double-brooded.



91. Golden-Banded Hesperid (*Eudamus cellus*).

Exceedingly rare in this neighborhood, but more common in the Southern States and Mexico.



92. Northern Cloudy-Wing (*Eudamus pylades*).

Common in open woods and fields near by; it flies rapidly, close to the ground, and it is single-brooded. Found from the latter part of May to the middle of August. The caterpillar feeds on clover and bush-clover (*Lespedeza*).

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93. Southern Cloudy-Wing (*Eudamus bathyllus*).

Found during June and July in the same places as *E. pylades*, but it is less common. It is single-brooded. The caterpillar feeds on wild bean, bush-clover (*Lespedeza*), butterfly-pea (*Eutrosema virginianum*), hoary pea (*Tephrosia*) and probably other plants belonging to the family *Leguminosæ* (Pulse family).



94. Silver-Spotted Hesperid (*Eudamus tityrus*).

Common everywhere in this vicinity, from May to September. Double-brooded. The caterpillar feeds on locust, acacia, wistaria, milk-vetch (*Astragalus*), tick-trefoil (*Desmodium*) and wild bean (*Apios*).

A watercolor painting showing a branch of a locust-tree with male and female butterflies, the caterpillar and the chrysalid of the Silver-Spotted, or Locust, Hesperid and illustrating the effect of the insect on the leaf is on exhibition in the Hall of North American Forestry.

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95. Hoary Cloudy-Wing (*Eudamus lycidas*).

Not common. It may be found in June and July in open places and edges of woods. The flight of the butterfly is swift, and it darts off very rapidly when disturbed. Besides alighting on flowers, it has the habit of sitting on the tips of dead branches of bushes and young trees. It is single-brooded. The caterpillar feeds on tick-trefoil (*Desmodium*) and other *Leguminosæ*.



96. Long-Tailed Hesperid (*Eudamus proteus*).

Exceedingly rare in this neighborhood, but very common in the Southern States. The caterpillar feeds on wild bean (*Phaseolus*), butterfly-pea (*Clitoria*), wistaria, tick-trefoil (*Desmodium*) and other allied plants

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WHAT IT IS DOING FOR SCIENCE :

- Maintains exploring parties in various parts of the United States and in :
 - Siberia, British Columbia, Alaska, Peru,
 - China, Mexico, Bolivia, Central America.
- Maintains scientific publications :
 - Memoirs—eighteen numbers have been issued.
 - Bulletin—fifteen volumes have been issued.
 - Journal—one volume has been issued.

What the Museum Needs.

- Additional members.
- Increased subscriptions to defray expenses of exploring expeditions.
- Funds to make additional groups similar to those in the Bird, Mammal, and Ethnology Halls.
- Small sums sufficient to preserve the records of the Indians of New York.
- Means for collecting and preserving representative examples of animals on the verge of extinction.
- Means for collecting fossils and geological specimens.

Membership Fees :

Annual Members,.....	\$ 10.
Life Members,.....	100.
Fellows,.....	500.
Patrons,.....	1,000.

All money received from membership fees is used for increasing the collections.

Publications.

The publications of the Museum consist of an Annual Report, in octavo, about 80 pages; the Bulletin, in octavo, of which one volume, consisting of about 400 pages, and about 25 plates, with numerous text figures, is published annually; the Memoirs, in quarto, published in parts at irregular intervals; an Ethnographical Album, issued in parts, and the American Museum Journal.